The Center for Control, Dynamical Systems, and Computation
University of California at Santa Barbara
Winter 2010 Seminar Series
Presents

Dynamics and Control Research Without Constraints

Raff D'Andrea
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Abstract:

In this talk I will discuss various control-enabled, non-mainstream projects: The Robotic Chair, a performance piece that collapses into six separate pieces - seat, back, and four legs - and then proceeds to reassemble itself; the Balancing Cube, a structure that can balance on any one of its edges or corners using six rotating mechanisms on the cube's inner faces; the Distributed Flight Array, a flying platform consisting of multiple autonomous single propeller vehicles that are able to drive, dock with their peers, and fly in a coordinated fashion; the Blind Juggler, a robot that can keep multiple balls bouncing on a paddle without any sensory input; the Flying Machine Arena, a research-driven airspace where vehicles teach themselves - and each other - how to fly; Powered Wingsuit Flight, where small jets secured to the flyer's feet are used to increase glide performance and maneuverability.

About the Speaker:

Raffaello D'Andrea is Professor of Dynamic Systems and Control at ETH Zurich and Technical Co-Founder of Kiva Systems, a company that develops adaptive and self-configuring warehouse automation systems using hundreds of networked, mobile robots. Also a creator of dynamic sculpture, he has shown his work at international venues including the Venice Bienale, the Luminato Festival, Ars Electronica and ideaCity; two of his pieces are in the permanent collection of the National Gallery of Canada. He is an IEEE Fellow and a recipient of the IEEE/IFR Invention and Entrepeneurship Award, a United States Presidential Early Career Award for Science and Engineering, and two best papers award from the American Automatic Control Council and the IEEE. He was the faculty advisor and system architect of the Cornell Robot Soccer Team, four-time world champions at the international RoboCup competition in Sweden, Australia, Italy and Japan. He is also a recipient of a National Science Foundation Career Award and several teaching awards in the area of project-based learning.